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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,360	11/14/2003	Kevin R. Shea	MICRON.276A	9170
20995	7590	11/09/2004	EXAMINER	
KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614			ANYA, IGWE U	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,360

Applicant(s)

SHEA, KEVIN R.

Examiner

Igwe U. Anya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-16 and 40-53 is/are allowed.
- 6) ☒ Claim(s) 17, 18, 28, 29, 33, 38, 39 and 54-61 is/are rejected.
- 7) ☒ Claim(s) 19-27, 30-32 and 34-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/26/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

- need to be dependent*
1. Claims 58 and 59 ~~to depend~~ on claim 57 or rewritten to remove antecedent basis. Appropriate correction required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 17, 18, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Kohyama (US 5616961).
4. Kohyama teaches a method of fabricating a semiconductor, comprising:
- providing a surface on a substrate (figs. 5A) comprising a titanium nitride (16-I, & col. 9 lines 21 –23) and a photoresist (15 & col. 7 lines 25 – 29);
- selectively recessing the metal nitride relative to the photoresist (fig. 5B);
- wherein the surface further comprises an insulating layer (13) and the metal nitride (16-I) extends vertically along a vertical wall of the insulating layer (fig. 5B) ; and
- wherein the insulating layer comprises BPSG (col. 5 lines 14 – 16).

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5. Claims 33, 38, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Zenke (US 6020248).

6. Zenke teaches a method of fabricating an integrated circuit, comprising:
providing a structural material on a semiconductor substrate, the structural material having a container (fig. 2A);
depositing a metal nitride layer (fig. 2C element 12e) inside the container; and
preferentially partially removing the metal nitride layer by exposing the metal nitride layer to a peroxide mixture, wherein exposing the metal nitride layer to a peroxide mixture comprises maintaining the semiconductor substrate at a temperature between about 20°C and about 55°C and the metal nitride comprises titanium nitride (col.⁵_A lines 3 – 12).

7. Claims 54 – 61 are rejected under 35 U.S.C. 102(e) as being anticipated by Zheng (US 2004/0014279).

8. The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

9. Zheng teaches a semiconductor device in an integrated circuit, comprising:
an insulating layer (140) having a cavity (150), the cavity partially defined by a generally vertical surface of the insulating layer (fig. 1);

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a metallic layer (320) extending vertically along the surface, wherein the vertical surface is between about 0.5 micron and about 5.0 micron in height (paragraph 38) and wherein the metallic layer is between about 100 Å and about 500 Å below a top of the vertical surface (paragraph 86, & figs. 17, 24);

wherein cavity is a cylindrical volume (paragraph 35); and

wherein the cavity has a width of between about 0.03 micron and about 1.0 micron, and the metallic layer comprises titanium nitride (paragraph 85).

10. Claims 19 – 27, 30 – 32, 34 – 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 1 – 16, and 40 – 53 are allowable, because prior art does not teach preferentially recessing metal nitride and or HSG silicon relative to a photoresist.

12. Prior art considered, but not used in the rejection include Li (US 6306775), Dennison et al. (US 5270241), Basceri et al. (US 6753618), and Nakamura (US 2003/0025145).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igwe U. Anya whose telephone number is (571) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya
Examiner
Art Unit 2825

IA

October 19, 2004



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800